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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/892,836	07/15/97	SKEEM M	F-3278

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EXAMINER	
NGUYEN,G	
ART UNIT	**PAPER NUMBER**
3203	

DATE MAILED: 10/03/97

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.	Applicant(s)
08/892,836	Skeem et al.
Examiner	**Group Art Unit**
Nguyen	3203

☒ Responsive to communication(s) filed on *the preliminary amendment dated September 18, 1997*.

☒ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire *3* month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) *1-34* is/are pending in the application.

Of the above, claim(s) *2 and 27* is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) *1, 3-26, and 28-34* is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐approved ☐disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____.

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). *18*

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 3-26, and 28-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Asada'276 in view of Scott'072 and Knippenberg et al.'568.

With reference to Figures 4 and 6, Asada discloses an abrasive cutting tool comprising: a) a monolithic substrate (5) having a substrate surface with plurality of teeth (7) extending therefrom, each tooth having a contoured surface; b) a layer comprising superabrasive grains (8) such as diamond, the layer being electroplated to at least a portion of the surface of each tooth to define a plurality of cutting levels parallel to the substrate surface, and each cutting level on each tooth being oriented such that a portion of each cutting level overlaps at least a portion of each other cutting level of the tooth; and c) an initial uppermost cutting level and successive uppermost cutting levels among the plurality of cutting levels of each tooth, whereby after the initial uppermost cutting level has been worn away by cutting the workpiece, each successive uppermost cutting level of the tooth presents to the workpiece a ring of superabrasive grain around the contoured surface of the tooth, and substantially all superabrasive grain within the ring simultaneously engages in cutting. But Asada does not disclose the cutting surface having a negative angle of inclination with respect to the intended direction of movement and the abrasive layer being chemically bonded to at least a portion of the surface of each tooth.

With reference to Figs. 2-4, column 4, line 50 bridging to column 5, line 50, Scott discloses that the mesh cutting element 34 defines a surface inclined relative to the travel direction 50 of the cutting tool. The cutting element 34 is a mesh comprising abrasive material formed by uniformly distributing and securing hard, wear resistance particles, such as industrial diamonds. The cutting mesh is bonded to the support links by an adhesive agent such as industrial epoxy or by brazing. The bonding agent may also include a layer or wearable or consumable material to provide additional support for the cutting mesh on the support links. With reference to Fig. 8, column 7, line 33 bridging to column 8, line 12, the inclination of the planar surface of the mesh, whether it is on the support or the cover, applies only a relatively small area of the trailing edge of the mesh cutting element to the material cut. This reduces the area of contact between the material to be cut and the cutting element, and thereby reduces the force required to accomplish the cutting action. As the mesh cutting element 34 wears at its trailing edge, some of the consumable material 48 following the cutting element 34 also wears away. However, it always leaves a next row of particles in abrading contact with the material to be cut. In essence, Scott discloses a cutting element having a cutting surface with a negative angle of inclination with respect to the intended direction of movement. Furthermore, Scott discloses in column 8, lines 16-18, this cutting element with its inclined cutting surface may be applied to a circular saw. But Scott is silent about the brazing method to chemically bond the abrasive layer to the surface of the tooth.

Knippenberg et al.'568 discloses a method for chemically bonding diamonds by means of brazing with a brazing filler consisting of an alloy of aluminum and silicon. With reference to column 1, lines 4-10, it is notoriously well-known that a mechanically very strong securement of diamond, in example for the manufacture of tools, may be effected with the aid of a brazing filler

of titanium on the basis of silver and copper. In that case the wetting of the diamond surface is in fact effected by titanium or a compound of titanium and one of the other metals produced at the soldering temperature.

Asada and Scott disclose the claimed device except for the brazing method to chemically bond the abrasive layer to the surface of the tooth. Knippenberg discloses that it is known in the art to provide a brazing filler of titanium to wet the diamond surface to chemically bond the diamond to the braze to provide a very strong securement of the diamond to the tooth. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the abrasive tool of Asada and Scott with the brazing method of Knippenberg, in order to wet the diamond surface to chemically bond the diamond to the braze to provide a very strong securement of the diamond to the tooth.

In regard to claims 4-12, 15-26, and 31-32, it would have been obvious matter of design choice to select the grain concentration and hardness index for the tooth depending on the material to be cut. Such engineering specification is well within the skill of the artisan.

In regard to claims 33-34, it would have been obvious matter design choice to apply the cutting element to core drills or abrasive sheets depending on the intended use.

Response to Arguments

3. Applicant's arguments with respect to claims 1, 3-26, and 28-32 have been considered but are moot in view of the new ground(s) of rejection.

Please note that this action is made final because the brazing method disclosed in Scott reference does chemically bond the abrasive layer to the surface of the tooth. Knippenberg reference is cited to merely elaborate that the brazing method using a brazing filler of titanium is

notoriously well-known in the art. In addition, the examiner brings to the applicant's attention reference Lowder et al.'576 submitted in the appendix A of the applicant's amendment dated February 3, 1997. Lowder et al.'576 discloses in columns 7 and 8 (Example V) that it is notoriously well-known in the art to use a brazing filler of nickel-chromium to provide excellent adhesion of diamond and excellent cutting action.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. De Bruin et al.'956 discloses method of chemical bonding of metals to ceramic materials. Beeferman et al.'012 discloses titanium hydride coated brazing product. Kondo et al.'323 discloses method for joining ceramics.

5. This is a File Wrapper Continuation of applicant's earlier Application No. 08/616538. All claims are drawn to the same invention claimed in the earlier application and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the earlier application. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action in this case. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for response to this final action is set to expire THREE MONTHS from the date of this action. In the event a first response is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event will the statutory period for response expire later than SIX MONTHS from the date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Nguyen whose telephone number is (703) 308-0163. The examiner can normally be reached on Monday-Friday from 7:00 AM-3:00 PM.
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Kisliuk, can be reached at (703) 308-1358. The fax number for this Group is (703) 305-3579.
An inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist at (703) 308-1148.

George Nguyen

September 25, 1997

ROBERT A. ROSE
PRIMARY EXAMINER
ART UNIT 323